

## Seeding Rangeland

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Sustaining natural resources and productive environments, such as Texas rangelands, requires skilled, science-based management. Range seeding is a management tool that can help you develop, alter and improve the range ecosystem. Range seeding is expensive and there is always some risk of failure. In many cases, though, seeding may be the most practical and environmentally sound practice for restoring rangelands and missing ecosystem functions.

The objective of range seeding is usually to alter the composition of vegetation so that the productivity of the land, especially its livestock grazing capacity, will increase. Restoring the production potential of deteriorated rangeland is attractive to ranchers whose operations are not profitable. However, seeding is not a cure for bad management or a substitute for good management. Managers must assess the causes of rangeland deterioration and address them. Seeding alone will not solve problems that previous management has created, nor is seeding always profitable in terms of forage produced.

Sometimes the objective of seeding is to revegetate barren or abandoned croplands, revegetate land after a prescribed fire, create a better seasonal balance in the forage supply, improve the quality and quantity of forage, reestablish native plants, or establish ground cover to prevent soil erosion and water runoff. Seeding can be a good tool for achieving these objectives.

What does a successful seeding look like? There are various opinions. The seeding rate for native grasses is 20 live seed planted per square foot, with a goal (when the objective is range improvement and land restoration) of two established plants per square foot, or 10 percent. Purchase seed on a pure live seed (PSL) basis. Some people may define a successful seeding as simply the introduction of a new plant species. Others may expect a successful seeding to resemble a planted row crop field. Whatever your expectation, there is a good chance that the seeded area will not look quite as you envisioned, at least not right away. Managers need patience, because grass seed may germinate over several years. Native grasses such as big bluestem may require 3 years or longer to become fully established.

### Requirements for Successful Seeding

The greatest risk in range seeding lies in our inability to predict rainfall and other conditions at planting and during the establishment period. The chance of success decreases dramatically the farther west and north you go, because of low rainfall. You can expect a high rate of

success where annual rainfall exceeds 35 inches, but in the Trans Pecos region of Texas seeding may be successful only one year in five. There are other risks associated with the planting process and the selection of seed. A complete discussion of rangeland seeding can be found in Extension publication B-1379, "Seeding Rangeland."

#### 1) Deciding to seed.

Determining whether rangeland can be restored by natural means or will require seeding is a matter of judgement. Improved management alone, particularly with livestock grazing, can restore some depleted ranges. Generally, if more than 10 percent of the vegetation is desirable native species, a manager can rely on natural succession. But the manager must understand the cause or causes of range deterioration and know how to manage the land during the natural revegetation process. Seeding may be the best tool if not enough desirable native plants remain on the land. Allowing natural processes to occur may be cheaper than seeding, but it will likely take many years for deteriorated grazing or farming lands to recover. The outcome is also uncertain because the vegetative mix is unpredictable. The fact is, abused lands may never return to their historical state because of soil loss and other conditions. We often have to accept what we get and adjust our management to actual conditions. We do not have enough money to change nature.

#### 2) Grass mixture versus monoculture.

Because many landowners have one goal in mind, they do not always consider the effects land management practices may have on other aspects of the ecosystem. Loss of vegetation diversity will lead to a loss of wildlife diversity and threaten the sustainability of natural ecological functions. Planting a monoculture, or single species, can fragment wildlife habitat. It may be easier to plant and manage just one or a few plant species; it may even be easier in the short term to manage livestock with a monoculture. However, when a mixture of plants is seeded the benefits are better ground cover, a more varied diet for animals, and less risk in getting a stand established if the soil is heterogeneous. A diverse plant community is much more resilient to drought, insects and diseases than a monoculture. Planting a mixture of grasses and other kinds of plants gives the manager greater flexibility in using the land.

#### 3) Moisture.

Successful seeding requires planning. To capitalize on moisture cycles, seeding should take place when the soil contains enough moisture for seeds to germinate

and plants to become established. For native, warm-season, perennial grasses, the best planting time usually is March and early April. Plans for seeding should be canceled if there is insufficient moisture in the soil at planting or if the long-range forecast is for inadequate rainfall. Seedling grasses need 29 to 30 days of appropriate temperature and moisture to establish good root systems and store nutrients so that they can survive the next dry period or dormant season.

#### 4) Seed selection.

Finding appropriate seed is sometimes difficult. Seeds are not available for all species and varieties of native plants. If you plant varieties not adapted to your area, your risk of failure will be much greater. Non-adapted varieties may not perform satisfactorily, may go dormant earlier, green up later, and be more prone to damage from frost, drought or extremely wet weather. If you plan to plant native grasses, be sure to select seed varieties that originated no more than 200 miles north or south and 100 miles east or west of your area. Ask your seed dealer about the origin of seed.

#### 5) Native versus non-native plants.

Native plants are usually preferable to non-native plants. Introduced plant species often become invasive weeds that compete with native plants. Planting non-native species increases the risk associated with rangeland seeding, especially if the manager does not understand the properties of the plants. Many of the introduced grasses on rangelands today were selected for their resistance to overgrazing, but are extremely competitive with native plants and have become pests. Examples include Johnsongrass, perennial ryegrass, Bahiagrass, common bermudagrass, King Ranch bluestem, Old World bluestem, medusahead, cheatgrass and Caucasian bluestem. Similar results have occurred with introduced forbs, legumes and trees such as Kudzu, Chinese tallowtree, kochia, Korean lespedeza, yellow sweetclover, Russian olive, lantana and salt cedar.

#### 6) Planting method.

Because it is important that seeds have good contact with the soil, drilling seed is the most successful planting method. If drilling is not practical, soil/seed contact can be improved by disturbing the soil with roller chopping or "lite" raking before seed is broadcast. Seeding often follows brush control treatments, especially root plowing. The least successful planting method is aerial seeding, but it may be the only practical way of seeding large or rough areas. Native grass seeds are small and are generally planted from 1/8 to 1/4 inch deep. Planting seeds deeper makes it hard for seedlings to reach the surface and may result in a weak stand.

#### 7) Land preparation.

If plowed sites are to be seeded, they should be given time to firm up before planting. Otherwise, the seedbed will not provide adequate soil/seed contact. Seeding in loose, air-filled soils may cause low seedling survival. If seeding is to be done in March or April, the seedbed should be prepared in late August or September to allow time for natural settling and firming of the soil.

#### 8) Weed control.

When soil is disturbed for planting, it is natural for weeds to germinate and grow along with the native plants that were seeded. You can reduce the competition from weeds by disking between seeded rows or using herbicides to control them. There is less risk of injuring seedling grasses if chemicals are not used until young grasses reach the four- to six-leaf stage of growth.

Range seeding is risky. Plan accordingly and be prepared to adjust your management to prevent future crises. To get the most benefit from seeding you may need to shift your overall management of the land resource. Areas seeded with native grasses usually require better grazing management and at least a 1-year deferment from grazing during the establishment phase.

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For further information:

B-1379, Seeding Rangeland, Texas Agricultural Extension Service.

For additional range management information see: <http://texnat.tamu.edu>

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